

ABSTRACT

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2 The invention described herein discloses a chemical mechanical machining and
3 surface finishing process. A conversion coating is formed on the surface of a workpiece
4 and is removed via relative motion with a tool, thereby exposing the workpiece to further
5 reaction with the active chemistry. Low mechanical forces are used such that the plastic
6 deformation, shear strength, tensile strength and/or thermal degradation temperature of the
7 workpiece are not exceeded. Since the chemical mechanical machining and surface
8 finishing process requires little force and/or speed of contact to remove the conversion
9 coating, the equipment's mass, complexity and cost can be significantly reduced, while
10 simultaneously increasing machining precision and accuracy. The present invention lends
11 itself to a very controlled rate of metal removal, and can simply surface finish the
12 workpiece, or if desired, can surface finish the workpiece simultaneously with the shaping
13 and/or sizing process.